Customer No. 01333 **Attorney Docket No. 87182SHS**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:
Ronald S. Cok

ORGANIC POLARIZED LIGHT EMITTING DIODE DISPLAY WITH POLARIZER

U.S. Serial No. 10/694,550

Filed: 27 October 2003

Group Art Unit: 2879

Examiner: Dalei Dong

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop - Appeal Brief - Patents, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Susan E. Tufts

Date: May 16, 2007

Mail Stop - APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 and 35 U.S.C. 134

Table Of Contents

APPELLANT'S BRIEF ON APPEAL

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1-17, which was contained in the Office Action, mailed October 19, 2006.

A timely Notice of Appeal was filed January 19, 2007.

Real Party In Interest

As indicated above in the caption of the Brief, the Eastman Kodak Company is the real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 1-17 are pending in the application.

Claims 1-17 are rejected, under 35 U.S.C. 103.

Claims 1-17 are being appealed.

Appendix I, provides a clean, double-spaced copy of the claims on appeal.

Status Of Amendments

A Pre-Appeal Brief Request For Review requesting reconsideration of the final rejection was filed January 16, 2007. A Notice of Panel Decision from Pre-Appeal Brief Review dated February 16, 2007 was then received, indicating that application remains under appeal.

Summary of Claimed Subject Matter

Independent Claim 1 is directed toward an organic light emitting diode display, comprising: a) a substrate **12** (Fig.1, Spec. - page 4, line 11); b) a plurality of OLEDs **19R, 19g, 19B** formed on the substrate **12** (Fig.1, Spec. - page 4, lines 10-15) , the OLEDs emitting polarized light wherein the OLEDs comprise: i) a layer defining a periodic grating structure **16** (Fig.1, Spec. - page 4, lines 22-27); ii) a first electrode layer **18** conforming to the grating structure (Fig.1, Spec. - page 4, line 27); iii) an OLED material layer **19** formed over the first electrode layer and conforming to the grating structure (Fig.1, Spec. - page 4, line 28); and iv) a second electrode layer **30** formed over the OLED material layer **19** and conforming to the grating structure (Fig.1, Spec. - page 4, lines 28-31), wherein the first and/or second electrode layers are metallic layers, whereby the periodic grating structure induces surface plasmon cross-coupling in the metallic electrode layer(s) to emit polarized light (Fig.1, Spec. - page 4, lines 25-27); and c) a polarizer **40** located over the substrate **12** or an encapsulating cover **36** through which the polarized light is emitted (Spec. - page 5, lines 17-25), wherein the polarizer is oriented such that the emitted polarized light passes through the polarizer without being substantially absorbed (Spec. - page 5, lines 25-28).

Grounds of Rejection to be Reviewed on Appeal

The following issues are presented for review by the Board of Patent Appeals and Interferences:

1. Claims 1-4, 7, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samuel (U.S. Patent No. 6,967,437) in view of May (U.S. Patent No. 6,211,613).

2. Claims 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samuel (U.S. Patent No. 6,967,437) in view of May (U.S. Patent No. 6,211,613 in further view of Kawase (U.S. Patent No. 6,815,886).

3. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samuel (U.S. Patent No. 6,967,437) in view of May (U.S. Patent No. 6,211,613) and further in view of Biebuyck (U.S. Patent No. 5,855,994).

The present claims are thus directed towards an organic light emitting diode display that includes a plurality of OLEDs formed on a substrate. The OLEDs emit polarized light by utilizing a structure embodying:

i) a layer defining a periodic grating structure,

ii) a first electrode layer conforming to the grating structure,

iii) an OLED material layer formed over the first electrode layer and conforming to the grating structure, and

iv) a second electrode layer formed over the OLED material layer and conforming to the grating structure, wherein the first and/or second electrode layers are metallic layers, whereby the periodic grating structure induces surface plasmon cross coupling in the metallic electrode layer for emission of polarized light.

The emission of polarized light is subsequently used in a non-conventional manner. That is the emitted polarized light is directed to a polarizer located over the substrate or an encapsulating cover. The polarizer is oriented such that the emitted polarized light passes through the polarizer without being substantially absorbed. The usage of the polarizer in this manner is novel because it is not being used to produce polarized light from unpolarized light. To the contrary, the polarizer is reducing the amount of light traditionally absorbed by an OLED display.

Arguments

Claims 1-4, 7, and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,967,437 to Samuel in view of U.S. Patent No. 6,211,613 to May. This rejection represents clear error, however, as it is based on erroneous interpretations of the Samuel and May disclosures. In particular, contrary to the Examiner's statements, while column 2, lines 55-62 of Samuel notes that surface plasmon polarization modes associated with metal contacts is one of the available modes of emitted energy in an LED structure, and Samuel does disclose a periodic grating structure, Samuel does not teach that the periodic grating structures suggested therein are configured to induce surface plasmon cross coupling in the metallic electrode layer to emit polarized light. Samuel rather only teaches at column 2, lines 55-62 that surface plasmon polarization is one of the available modes of emitted energy from an LED structure, along with radiative modes and trapped guided modes. In actuality, the emitted energy for LED structures may be in the form of any combination of such various possible individual modes. Thus, there is no factual basis for the Examiner's own interpretations that when an LED structure is capable of operating in a mode of surface plasmon polarization, every component of the LED structure is configured to induce surface plasmon in order to operate in that specific mode.

Samuel does not teach use of any specific configuration to induce surface plasmon cross-coupling to directly produce polarized emitted light, but rather goes on to teach microstructure designed to Bragg scatter already emitted trap guided mode emissions. Column 3, line 59 – column 5, line 14, e.g., teaches that while emission radiated from planar LED devices is in general un-polarized, configuring a microstructure grating to Bragg scatter guided modes produced by emission from the emitters in the structure may be useful for controlling the polarization state of the emitted radiation. Thus, to the extent polarized light emission is noted in Samuel, it is

attributed to microstructure features adapted to result in Bragg scattering (column 4, lines 6-15), not to the use of a periodic grating structure configured to induce surface plasmon cross coupling in the metallic electrode layer as alleged by the Examiner. Thus, the rejection is based on a clearly erroneous interpretation of the teachings of Samuel relative to the present invention.

Additionally contrary to the Examiner's statements, while the polarizer of May is employed for improving the contrast of an EL display by absorbing light from the environment, there is no teaching in May of employing an EL device which is itself configured to emit light that is polarized prior to passing through the polarizer. While the light emitted by the EL device may become polarized after it is passed though a polarizer, there is no teaching in May to configure the EL device to actually initially emit polarized light, and to orient the circular polarizer such that emitted polarized light then passes through the polarizer without being substantially absorbed. Rather, as noted in Samuel, absent countervailing measures, emission radiated from planar LED devices is in general un-polarized. Accordingly, there is clearly no support for the Examiner's statement that May discloses an EL device comprising a circular polarizer oriented such that "the emitted polarized light" passes through the polarizer without being substantially absorbed. Again, the light emitted by the EL device in May is not taught as being polarized, and will only become polarized after it has passed through a polarizer. Thus, the Examiner's interpretation that "emitted polarized light" is passed through the circular polarizer of May is in clear error. Thus, the rejection is also based on a clearly erroneous interpretation of the teachings of May relative to the present invention.

Further, the proposed motivation of providing a polarizer in order to increase the contrast of the image by absorbing ambient light as taught by May would in any event not teach or suggest to orientate such a polarizer in any specific direction relative to the light emitted from the EL device itself, as May does not teach or suggest that the ability to increase the contrast by absorbing ambient light is dependent upon the relative orientation of the polarizer and the device. It is this unique combination as claimed which provides the combined advantages of the present invention (i.e., substantial absorption of ambient light, without substantial absorption of emitted polarized light), and which distinguished the invention from the

prior art. Accordingly, the present invention is clearly not taught or suggested by the proposed combination, and a prima facie case of obviousness has not been established. Reconsideration of this rejection is accordingly respectfully requested.

Claims 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,967,437 to Samuel in view of U.S. Patent No. 6,211,613 to May in further view of U.S. Patent No. 6,815,886 to Kawase. This rejection is also clearly erroraneous, as Kawase fails to overcome the basic deficiency of the rejection based on Samuel-May for the reasons discussed above. While Kawase describes light emitting devices comprising periodic grating structures in the form of a corrugated surface, as discussed at column 5, lines 7+ thereof, the basic function of the corrugated surface is to couple light in a waveguide propagation mode with light in a radiative mode; so as to cause much of the generated light, conventionally trapped in waveguide modes, to be emitted from the device in the radiative mode. As further discussed at column 5, lines 25+, refractive indices and thickness of active layers are selected to achieve the desired optical coupling. This optical waveguide coupling technique again is not a teaching to design such devices with periodic grating structure in order to induce surface plasmon cross coupling in metallic electrode layers. Accordingly, a prima facie case of obviousness has not been established.

Claims 14-17 are rejected under 35 U.S.C.103 (a) as being unpatentable over U.S. Patent No. 6,967,437 to Samuel, in view of U.S. Patent No. 6,211,613 to May, and further in view of U.S. Patent No. 5,855,994 to Biebuyck et al. This rejection reflects further clear error. Biebuyck may disclose an EL device comprising a diffuser, however, Biebuyck fails to overcome the basic deficiency of the rejection based on Samuel-May, as discussed above; and accordingly a prima facie case of obviousness has clearly not been established.

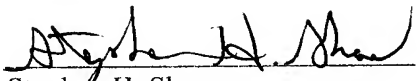
Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims 1-17.

The Commissioner is hereby authorized to charge any fees related to this communication to Eastman Kodak Company, Account No. 05-0225.

A duplicate copy of this sheet is enclosed.

Respectfully submitted,



Stephen H. Shaw.
Attorney for Appellant(s)
Registration No. 45,404

SHS/set
Tel. No.: (585) 477-7419
FAX: (585) 477-4646
stephen.h.shaw@kodak.com

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Appendix I - Claims on Appeal

1. An organic light emitting diode display, comprising:

a) a substrate;

b) a plurality of OLEDs formed on the substrate, the OLEDs emitting polarized light wherein the OLEDs comprise:

i) a layer defining a periodic grating structure,

ii) a first electrode layer conforming to the grating structure,

iii) an OLED material layer formed over the first electrode layer and conforming to the grating structure, and

iv) a second electrode layer formed over the OLED material layer and conforming to the grating structure, wherein the first and/or second electrode layers are metallic layers, whereby the periodic grating structure induces surface plasmon cross coupling in the metallic electrode layer(s) to emit polarized light; and

c) a polarizer located over the substrate or an encapsulating cover through which the polarized light is emitted, wherein the polarizer is oriented such that the emitted polarized light passes through the polarizer without being substantially absorbed.

2. The display claimed in claim 1, wherein the polarizer is a circular polarizer.

3. The display claimed in claim 1, wherein the display is a top emitting display having an encapsulating cover, and the polarizer is affixed to the encapsulating cover.

4. The display claimed in claim 1, wherein the display is a bottom emitting display and the polarizer is affixed to the substrate.

5. The display claimed in claim 1, wherein the OLED material layer includes portions for emitting different colors of light and the period of the grating structure is different for the different colors.

6. The display claimed in claim 1, wherein the layer defining a grating structure is a light absorbing layer.

7. The display claimed in claim 1, wherein the metallic layers are opaque.

8. The display claimed in claim 1, wherein the grating structure is a two dimensional grating.

9. The display claimed in claim 1, wherein the display is an active matrix display.

10. The display claimed in claim 1, wherein the display is a passive matrix display.

11. The display claimed in claim 1, wherein the first electrode layer is non-metallic and further comprising a metallic layer formed on the first electrode layer and conforming to the grating structure.

12. The display claimed in claim 1, wherein the first electrode layer is indium tin oxide.

13. The display claimed in claim 1, wherein the OLEDs further comprise an insulating layer formed over the substrate, the insulating layer defining a periodic grating structure; a first electrode layer formed over the insulating layer and conforming to the grating structure; an OLED material layer formed over the first electrode layer and conforming to the grating structure; and a second electrode layer formed over the OLED material layer and conforming to the grating structure, wherein the first and/or second electrode layers are metallic layers, whereby the periodic grating structure induces surface plasmon cross coupling in the metallic electrode layer(s).

14. The display claimed in claim 5, further comprising a diffuser to mitigate the effect of color aberrations.

15. The display claimed in claim 14, wherein the diffuser is applied to the exterior of the device.

16. The display claimed in claim 14, wherein the display is a bottom emitting display and the diffuser is incorporated into the substrate.

17. The display claimed in claim 14, wherein the display is a top emitting display having an encapsulating cover, and the diffuser is incorporated into the encapsulating cover.

Appendix II - Evidence

None

Appendix III – Related Proceedings

None